

WHAT IS CLAIMED IS:

5 1. A mechanism for measuring the useful life of a reusable or disposable device having at least two parts that are intended to be fitted together prior to each use of the device comprising a counter, and an actuator for driving the counter in response to each fitting of the parts together.

10 2. The mechanism of claim 1 wherein the actuator is driven by the mechanical action of fitting the parts together.

15 3. The mechanism of claim 2 wherein the actuator has a cam surface that is engaged by one of the parts during fitting of the parts together to drive the actuator.

20 4. The mechanism of claim 1 wherein the actuator comprises a switch that is activated in response to the fitting of the parts together.

25 5. The mechanism of claim 4 wherein the switch comprises an electrical switch.

30 6. The mechanism of claim 4 wherein the switch comprises an optical switch.

7. The mechanism of claim 1 further comprising means for manually driving the actuator whenever the parts are fitted together.

8. The mechanism of claim 7 wherein the means for manually driving the actuator comprises at least one of: a push button and a rotating knob.

9. The mechanism of claim 1 wherein the counter includes a display.

10. The mechanism of claim 9 wherein the display displays the number of times the device has been used based on the number of times the parts are fitted together.

11. The mechanism of claim 9 wherein the display counts down the number of uses remaining of the device based on the number of times the parts are fitted together.

12. The mechanism of claim 9 wherein the display includes a graphic display.

13. The mechanism of claim 9 wherein the display is an electronic display.

14. The mechanism of claim 13 wherein the electronic display comprises at least one of: an LCD display and an LED display.

15. The mechanism of claim 9 wherein the display is a mechanical display.

16. The mechanism of claim 15 wherein the mechanical display comprises at least one of: rotary numbered wheels and a moving bar graph.

17. The mechanism of claim 1 further comprising signaling means responsive to the device having been used a specified number of times based on the number of times the parts are fitted together to draw attention to the number of uses.

18. The mechanism of claim 17 wherein the signaling means comprises a flag that is caused to move to a prominent position when the device has been used a specified number of times to call attention to the number of uses.

19. The mechanism of claim 17 wherein the signaling means comprises a pin that is caused to move to a prominent position when the device has been used a specified number of times to call attention to the number of uses.

20. The mechanism of claim 17 wherein the signaling means comprises a light that is activated when the device has been used a specified number of times to call attention to the number of uses.

21. The mechanism of claim 20 wherein the light is caused to blink or flash when the device has been used a specified number of times.

22. The mechanism of claim 1 further comprising means for preventing use of the device after a specified number of uses based on the number of times the parts are fitted together.

23. The mechanism of claim 22 wherein the means for preventing comprises a shutter for blocking a light path to the device after the specified number of uses.

24. The mechanism of claim 23 wherein the shutter is mounted for pivotal movement into the light path.

25. The mechanism of claim 23 wherein the shutter comprises a rotary vane that is indexed by the actuator each time the counter is driven, the rotary vane having a light blocking portion that blocks the light path to the

device after the rotary vane has been indexed a specified number of times corresponding to the specified number of uses of the device.

26. The mechanism of claim 22 wherein the means for preventing comprises a switch for interrupting an electrical connection to the device after the specified number of uses.

27. The mechanism of claim 22 wherein the means for preventing comprises a valve for blocking a fluid path to the device after the specified number of uses.

28. The mechanism of claim 22 wherein the means for preventing comprises a mechanical element that prevents the parts from being fitted together after the specified number of uses.

29. The mechanism of claim 22 wherein the mechanical element extends into the path of the parts preventing the parts from being fitted together after the specified number of uses.

30. The mechanism of claim 29 further comprising means for causing the mechanical element to move out of the path of the parts to permit the parts to be fitted together up to the specified number of uses.

31. The mechanism of claim 1 which comprises an integral part of the device.

32. The mechanism of claim 1 which is removably attached to the device.

33. The mechanism of claim 1 further comprising means for resetting the counter after counting a specified number of uses based on the number of times the parts are fitted together.

5 34. The mechanism of claim 1 further comprising communication means for providing communication between the counter and other equipment.

10 35. The mechanism of claim 34 wherein the communication means downloads information from the counter to the other equipment.

36. The mechanism of claim 34 wherein the communication means receives information from the other equipment.

15 37. The mechanism of claim 1 which is electrically powered, and the mechanism includes its own electrical power supply to power the mechanism.

20 38. A mechanism for measuring the useful life of a reusable or disposable device that is intended to be sterilized in a sterilizing environment before each use comprising a counter, and an actuator for driving the counter in response to at least one environmental factor of the sterilizing environment in which the device is sterilized reaching a specified value validating that the device has been sterilized.

25 39. The mechanism of claim 38 further comprising means for measuring different environmental factors and parameters used to sterilize the device to determine the useful life of the device.

40. The mechanism of claim 38 wherein the environmental factor comprises at least one of the following: temperature, pressure, vacuum, gas or chemical concentration, radiation, light, and humidity.

5 41. The mechanism of claim 38 wherein the device is subjected to a plurality of environmental factors in the sterilizing environment, and the actuator is responsive to a combination of the environmental factors reaching specified values validating that the device has been sterilized.

10 42. The mechanism of claim 41 wherein the combination of environmental factors comprises at least two of the following: temperature, pressure, vacuum, gas or chemical concentration, radiation, light, and humidity.

15 43. The mechanism of claim 38 further comprising a recorder for recording at least one of: the specified value that the environmental factor attained and the length of time that the environmental factor was maintained during sterilization of the device.

20 44. The mechanism of claim 38 wherein the environmental factor is temperature, and the actuator comprises a bimetal strip that drives the counter whenever the temperature cycles above a specified value during sterilization of the device.

25 45. The mechanism of claim 38 wherein the environmental factor is a sterilizing chemical, and the actuator comprises a sensor that drives the counter when a concentration of the sterilizing chemical cycles above a specified value during sterilization of the device.

46. The mechanism of claim 38 wherein the environmental factor is humidity, and the actuator comprises a sensor that drives the counter when the humidity cycles above a specified value during sterilization of the device.

5 47. The mechanism of claim 38 wherein the environmental factor is radiation, and the actuator comprises a sensor that drives the counter when the radiation cycles above a specified value during sterilization of the device.

10 48. The mechanism of claim 38 wherein the counter includes a display that displays the number of times the device has been used based on the number of sterilizations of the device.

15 49. The mechanism of claim 38 wherein the counter includes a display that counts down the number of uses remaining of the device based on the number of sterilizations of the device.

20 50. The mechanism of claim 38 further comprising signaling means responsive to the device having been used a specified number of times based on the number of sterilizations of the device to draw attention to the number of uses.

25 51. The mechanism of claim 50 wherein the signaling means comprises a flag that is caused to move to a prominent position when the device has been used a specified number of times based on the number of sterilizations of the device.

30 52. The mechanism of claim 50 wherein the signaling means comprises a pin that is caused to move to a prominent position when the device has been used a specified number of times based on the number of sterilizations of the device.

53. The mechanism of claim 50 wherein the signaling means comprises a light that is activated when the device has been used a specified number of times based on the number of sterilizations of the device.

5 54. The mechanism of claim 38 further comprising means for preventing use of the device after a specified number of uses based on the number of sterilizations of the device.

10 55. A mechanism for measuring the useful life of a reusable or disposable device that is operable at a plurality of settings that have different effects on the useful life of the device comprising a timer for measuring the total time that the device is operated at each of the settings, and means for determining the useful life of the device based on such measurements.

15 56. The mechanism of claim 55 further comprising a recorder for recording the settings at which the device is operated and time measured.

20 57. The mechanism of claim 55 further comprising means for disabling the device after the useful life is reached based on such measurements.

25 58. The mechanism of claim 55 further comprising a display for displaying the remaining useful life of the device based on such measurements.

59. The mechanism of claim 55 further comprising signaling means for signaling when the device reaches its useful life based on such measurements.

30 60. A mechanism for measuring the useful life of a reusable or disposable device comprising a counter for counting each time the device is

used, and signaling means for signaling when the device has been used a specified number of times.

5 61. The mechanism of claim 60 wherein the signaling means comprises a flag that is caused to move to a prominent position when the device has been used the specified number of times.

10 62. The mechanism of claim 60 wherein the signaling means comprises a pin that is moved to a prominent position when the device has been used the specified number of times.

15 63. The mechanism of claim 60 wherein the signaling means comprises a light that is activated when the device has been used the specified number of times.

20 64. The mechanism of claim 60 further comprising means for preventing use of the device after the specified number of uses.

25 65. The mechanism of claim 64 wherein the means for preventing comprises a shutter for blocking a light path to the device after the specified number of uses.

30 66. The mechanism of claim 64 wherein the means for preventing comprises a switch for interrupting an electrical connection to the device after the specified number of uses.

 67. The mechanism of claim 64 wherein the means for preventing comprises a valve for blocking a fluid path to the device after the specified number of uses.

68. The mechanism of claim 64 wherein the means for preventing comprises a mechanical linkage that is disabled after the specified number of uses.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25